Claims

1. A system for interfacing a host computer to a Controller Area Network (CAN) bus, the system comprising:

a memory configured to store program code;

an embedded processor coupled to the memory, and configured to execute the program code;

bus interface logic coupled to the embedded processor, wherein the bus interface logic is operable to couple to an interconnecting bus, wherein the bus interface logic is adapted to interface with a device through the interconnecting bus;

CAN interface logic coupled to the embedded processor and adapted for interfacing with the CAN bus;

wherein the embedded processor is operable to execute the program code to perform a CAN event in response to said bus interface logic receiving a trigger signal on the interconnecting bus from the device.

2. The system of claim 1, wherein, in response to receiving the trigger signal, the embedded processor is operable to perform the CAN event substantially synchronously with an event performed by the peripheral device.

3. The system of claim 1, wherein the CAN event comprises transmission of a CAN frame onto the CAN bus.

4. The system of claim 1, wherein the CAN event comprises generating a timestamp defining a time-of-occurrence of the trigger signal and storing the timestamp in said memory.

5. The system of claim 1, wherein the bus interface logic is operable to receive the trigger signal on a first line of a plurality of lines on the bus;

wherein the embedded processor is operable to receive configuration information from the host computer, wherein the configuration information selects the first line among a plurality of lines of said interconnecting bus.

6. The system of claim 1, wherein the interconnecting bus is the Real-Time System Integration (RTSI) bus.

7. A system for interfacing a host computer to a Controller Area Network (CAN) bus, the system comprising:

a memory configured to store program code;

an embedded processor coupled to the memory, and configured to execute the program code;

bus interface logic coupled to the embedded processor, wherein the bus interface logic is operable to couple to an interconnecting bus, wherein the bus interface logic is adapted to interface with a device through the interconnecting bus;

CAN interface logic coupled to the embedded processor and adapted for interfacing with the CAN bus;

wherein the bus interface logic is configured to assert a trigger signal on the interconnecting bus to the device in response to the embedded processor performing a CAN event.

8. The system of claim 1, wherein the trigger signal is useable to direct the device to perform an event substantially synchronously with the CAN event.

9. The system of claim 7, wherein the CAN event comprises transmission of a CAN frame.

10. The system of claim 7, wherein the CAN event comprises reception of a CAN frame.

11. The system of claim 7, wherein the CAN event comprises receiving an indication of a function call invoked by a user application program running on the host computer.

12. The system of claim 7, wherein the embedded processor is operable to receive configuration information from the host computer, wherein the configuration information selects a first line among a plurality of lines of said interconnecting bus for transmission of the trigger signal.

13. The system of claim 7 wherein the interconnecting bus is a Real-Time System Integration (RTSI) bus.

14. A method for operating a Controller Area Network (CAN) interface, wherein the CAN interface and a peripheral device are both coupled to a host computer, wherein the CAN interface and the peripheral device are directly coupled through an interconnecting bus, the method comprising:

the CAN interface receiving a trigger from the peripheral device through an interconnecting bus; and

the CAN interface performing a CAN event in response to the trigger signal;

wherein, in response to receiving the trigger signal, the CAN interface performs the CAN event substantially synchronously with an event performed by the peripheral device.

15. The method of claim 14, wherein the CAN event comprises transmission of a CAN frame onto a CAN bus which couples to the CAN interface.

16. The method of claim 14, wherein the CAN event comprises generating a timestamp defining a time-of-occurrence of the trigger signal, and storing the timestamp in a memory of the CAN interface.

17. The method of claim 14, wherein the interconnecting bus is the Real-Time System Integration (RTSI) bus.

18. The method of claim 14, wherein the peripheral device transmits the trigger signal in response to performing a data transfer.

19. A method for operating a Controller Area Network (CAN) interface, wherein the CAN interface and a peripheral device are both coupled to a host computer, wherein the CAN interface and the peripheral device are directly coupled through an interconnecting bus, the method comprising:

the CAN interface performing a CAN event;

the CAN interface transmitting a trigger signal to the peripheral device through the interconnecting bus in response to the CAN interface performing the CAN event;

wherein the trigger signal is operable to direct the peripheral device to perform a peripheral event in response to the trigger signal.

20. The method of claim 19, wherein the CAN event comprises transmission of a CAN frame.

21. The method of claim 19, wherein the CAN event comprises reception of a CAN frame.

22. The method of claim 19, wherein the CAN event comprises receiving an indication of a function call invoked by a user application program running on the host computer.

23. The method of claim 19, wherein the interconnecting bus is a Real-Time System Integration (RTSI) bus.

24. A system for performing a measurement on a physical system, the system comprising:

a host computer system;

a peripheral device coupled to the host computer system, wherein the peripheral device couples to the physical system;

a Controller Area Network (CAN) bus;

one or more CAN devices coupled to the CAN bus, wherein the one or more CAN devices couple to the physical system;

an interconnecting bus; and

a CAN interface device coupled to the host computer system, wherein the CAN interface device is directly coupled to the peripheral device through the interconnecting bus;

wherein the CAN interface device and the peripheral device are operable to communicate with each other using the interconnecting bus to synchronize measurement and/or control operations on the physical system.

25. The system of claim 24,

wherein the CAN interface device includes:

bus interface logic for interfacing with the interconnecting bus;

CAN interface logic configured to interface with the CAN bus.

26. The system of claim 24,

wherein the peripheral device is operable to provide a signal over the interconnecting bus to the CAN interface device in response to a peripheral event occurring in the peripheral device;

wherein the CAN interface device is operable to receive the signal from the interconnecting bus, and to perform a CAN event in response to receiving the signal.

27. The system of claim 26, wherein the peripheral event comprises one or more of: initiation of a signal transmission from the peripheral device to the physical system; acquisition of a signal from the physical system; or

28. The system of claim 26, wherein the CAN event comprises one or more of: transmitting a CAN frame to one or more of the CAN devices; or generating a signal timestamp indicating a time-of-occurrence of the signal.

29. The system of claim 24,

wherein the CAN interface device is operable to provide a signal over the interconnecting bus to the peripheral device in response to a CAN event occurring in the CAN interface device;

wherein the peripheral device is operable to receive the signal from the interconnecting bus, and to perform a peripheral event in response to receiving the signal.

30. The system of claim 24, wherein the interconnecting bus is the Real-Time System Integration (RTSI) bus.

31. A method for correlating measurements in a system comprising a host computer system coupled to a CAN interface and a peripheral device, wherein the CAN interface is adapted to couple through a CAN bus to one or more CAN devices, wherein the CAN devices couple to a physical system, wherein the peripheral device is also adapted to couple to the physical system, wherein the peripheral device and the CAN interface are directly coupled through an interconnecting bus, the method comprising:

the CAN interface acquiring CAN data frames from the CAN bus;

the CAN interface generating CAN timestamps for the acquired CAN data frames;

the peripheral device transmitting a trigger signal on the interconnecting bus to the CAN interface in response to a peripheral event performed by the peripheral device;

the CAN interface receiving the trigger signal and generating a trigger timestamp for the trigger signal;

determining from the CAN timestamps and the trigger timestamps one or more of the CAN data frames which correlate in time with the peripheral event.

32. The method of claim 31, further comprising:

analyzing the physical system using the CAN data frames which correlate in time with the peripheral event.

33. The method of claim 31, wherein said determining is performed by the CAN interface.

34. The method of claim 31, further comprising the host computer system reading the CAN data frames, CAN timestamps and trigger timestamps, wherein said determining one or more CAN data frames which correlate in time with the peripheral event is performed by the host computer system.

35. The method of claim 31, wherein the peripheral event comprises one of: the peripheral device transmitting signals to the physical system; the peripheral device acquiring signals from the physical system; a clock signal transition.

36. The method of claim 31, wherein the interconnecting bus is the Real-Time System Integration (RTSI) bus.

37. A method for correlating measurements in a system comprising a host computer system coupled to a CAN interface and a peripheral device, wherein the CAN interface is adapted to couple through a CAN bus to one or more CAN devices, wherein the CAN devices couple to a physical system, wherein the peripheral device is also adapted to couple to the physical system, wherein the peripheral device and the CAN interface are directly coupled through an interconnecting bus, the method comprising:

the peripheral device transferring data values;

the peripheral device generating peripheral timestamps indicating times-of-transference of said data values;

the CAN interface performing a CAN frame transfer;

the CAN interface transmitting a trigger signal on the interconnecting bus to the peripheral device in response to the CAN frame transfer;

the peripheral device receiving the trigger signal and generating a trigger timestamp indicating a time-of-occurrence of the trigger signal;

determining from the peripheral timestamps and the trigger timestamp one or more of the data values which correlate in time with the CAN frame transfer.

38. The method of claim 37, wherein said peripheral device transferring data values comprises said peripheral device acquiring said data values from the physical system.

39. The method of claim 37, wherein said peripheral device transferring data value comprises said peripheral device transmitting said data value to the physical system.

40. The method of claim 37, wherein said CAN interface performing a CAN frame transfer comprises said CAN interface receiving a CAN frame from the CAN bus.

41. The method of claim 37, wherein said CAN interface performing a CAN frame transfer comprises said CAN interface transmitting a CAN frame onto the CAN bus.

42. The method of claim 37, wherein the interconnecting bus comprises the Real-Time System Integration (RTSI) bus.